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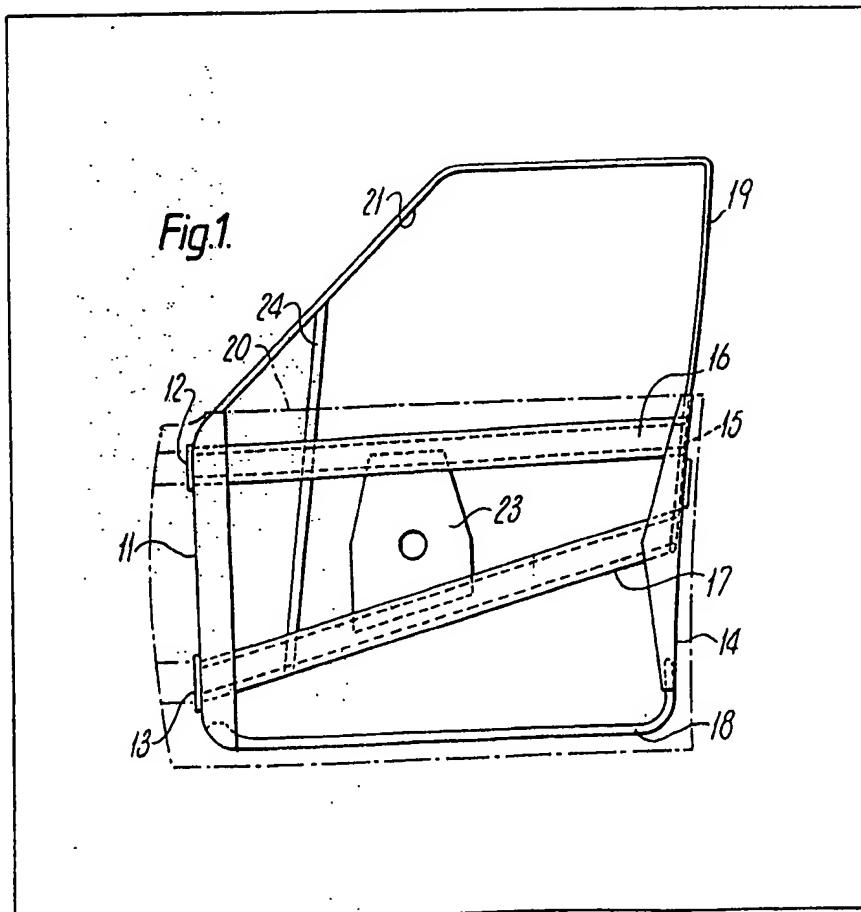
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(54) Vehicle door

(57) The door has a pair of hinge mountings 12, 13 on one edge and a latch mounting 15 on the opposite edge. The latch mounting is joined to each of the hinge mountings by a separate girder 16, 17. A vehicle

equipped with such a door has corresponding structural members for the hinge and latch mountings in the body of the vehicle so that the vehicle body is able to transmit compressive loads arising from front or rear collisions across the closed doors by way of the girders.



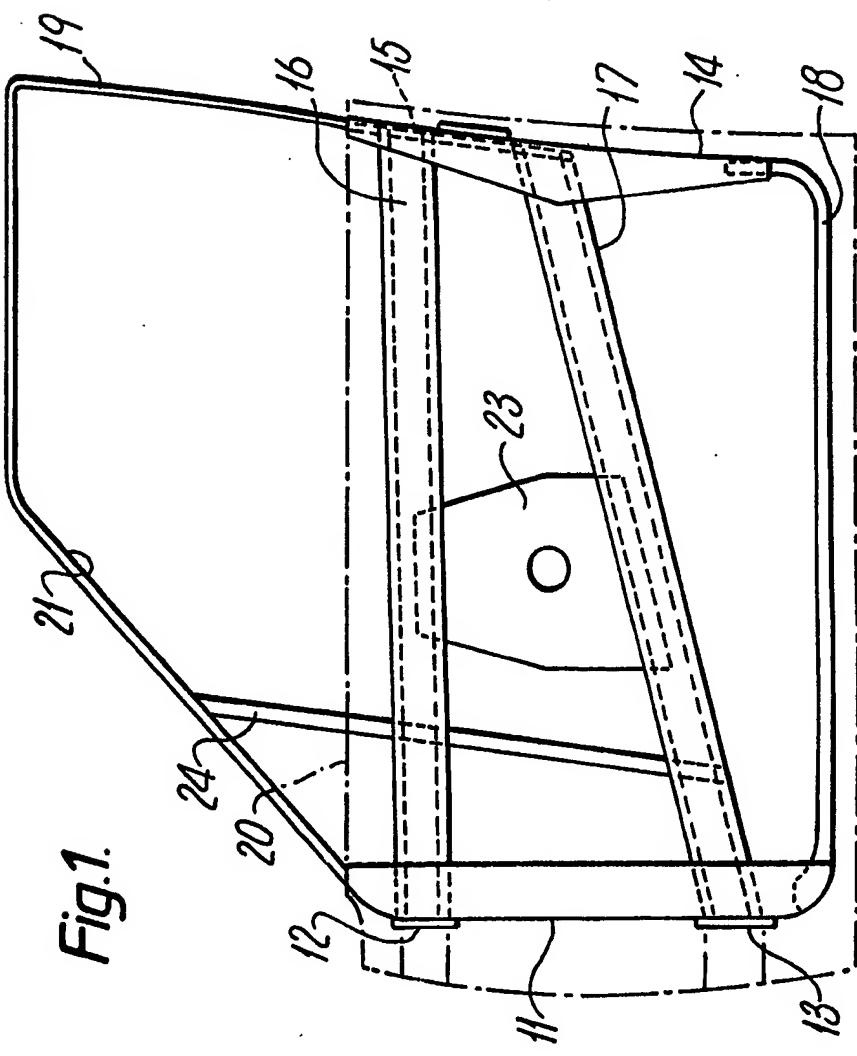
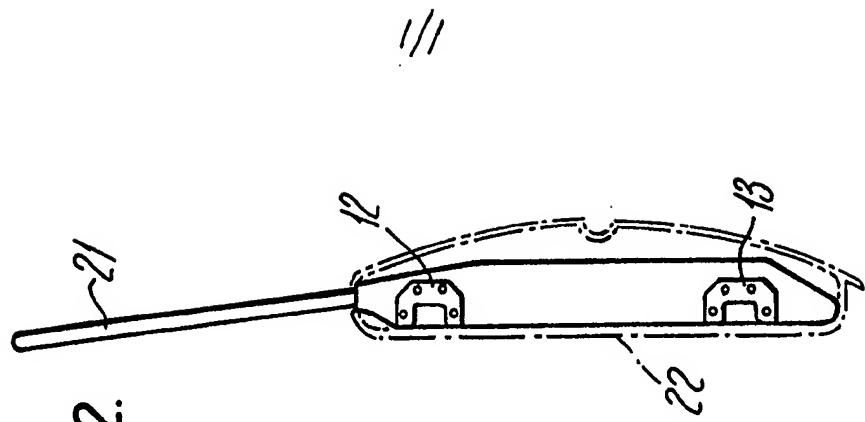


Fig. 2.



SPECIFICATION
A vehicle door

This invention relates to a door for a vehicle. A vehicle door usually consists of inner and

5 outer pressings joined together by clinched flanges making use of adhesives or welding. In some cases the whole door may consist of pressings which include an upper frame work for a glazing arrangement. In other cases smaller 10 pressings are used for the bottom part of the door with a separate rolled section framework for the glazing arrangement which is usually welded or bolted to the door pressing. This type of door needs reinforcement to sustain compressive loads 15 due to front or rear impacts on the vehicle and in some countries protection from lateral impact is required by law. Current legislation also calls for protection against a door coming open during impact or other adverse conditions so that the 20 latching and hinging arrangements of the door have to provide an anti-burst requirement.

According to a first aspect of the present invention there is provided a door for a vehicle comprising a first peripheral region on which are 25 disposed a spaced pair of hinge mountings for pivotably connecting the door to a vehicle body; a second peripheral region, opposite the first region, on which is disposed a mounting for a latch for the door; a first girder member extending between 30 one of the hinge mountings and the latch mounting and rigidly attached to both mountings; and a second girder member extending between the other of the pair of hinge mountings and the latch mounting and rigidly attached to both 35 mountings.

According to a second preferred form of the first aspect of the present invention the girder members have mounted on them at least part of a door mechanism such as a latch, window guide or 40 window winder.

According to a third preferred form of the first aspect of the present invention a door for a vehicle according to any of the previous forms includes 45 external cladding in the form of an outer skin panel and an inner cladding in the form of a trim panel.

According to a fourth preferred form of the first aspect of the present invention a door according to the third preferred form is characterised in that both the skin panel and the cladding panel are 50 unstressed.

According to a second aspect of the present invention there is provided a vehicle having at least one door according to any form of the first aspect which door is coupled to the body by way 55 of a hinge linking each hinge mounting on the door to a hinge mounting on the vehicle body; and there is provided a latch linking the latch mounting on the door to a latch mounting on the vehicle body, the hinge and latch mountings of the vehicle 60 body being coupled to structural members of the vehicle body adapted to resist compressive loads arising from front and/or rear impacts on the vehicle.

According to a second preferred form of the 65 second aspect of the present invention, there is provided a vehicle according to the first preferred form wherein the door girder members, at least with the door closed, co-operate with structural members of the body to resist lateral impacts on 70 the door.

An embodiment of the invention will now be described with reference to the accompanying drawings in which Figure 1 is an outside view of the vehicle door; and Figure 2 is a view of the door 75 in Figure 1 in the direction of the arrow II.

The door shown in the Figures has a front edge 11 on which are mounted a spaced pair of hinge mountings 12, 13. On the opposite side of the door the second peripheral region 14 has mounted 80 on it a latch plate 15. The hinge mounting 12 and the top of the latch mounting 15 are rigidly coupled by a U-section girder 16. The lower hinge mounting 13 is likewise coupled to the latch plate 15 by a second U-section girder 17. The front and 85 rear peripheral regions of the door 11, 14 are joined at their lower ends by a lower door frame member 18 and at their upper end by a window guide channel frame 19.

The form of the outer cladding for the door is 90 shown by a broken outline 20. The inner side of the door frame below the window aperture 21 is masked by a trim panel 22 shown in Figure 2. The door latch and window winders are not shown but are mounted on plate 23 extending between the 95 girders 16, 17. The girders also serve to carry a window guide channel 24 which serve to locate the leading edge of the window panel (not shown).

The load carrying structure of the door is made up of what could be described as the triangulated 100 connection between the girders 16 and 17 the latch plate 15 and the hinge mountings 12, 13. This triangulated arrangement carries the upper door framework made up of the channels 19 and 21 for the vertical operation of the window. The 105 triangulated structure allows for a ready change to the cladding provided for the exterior and the interior finish of the door since these have very little or no stressing in use.

In a vehicle making use of the door described in 110 connection with Figures 1 and 2 the complementary hinge mountings to the mountings 12 and 13 on the door are incorporated in further girder systems so that front or rear impacts on the vehicle result in loads which 115 are fed into the girder system of which girders 16 and 17 form a part. In this way the resultant compressive loads are fed into the whole vehicle structure. Among other advantages this will act to reduce the distortion of the door openings which 120 can occur in such impacts.

The girders 16 and 17 also serve to resist side impacts on the door and hinge mountings 12 and 13 and latch plate 15 can be angled so that lateral impacts on the door are fed by the girders 16 and 125 17 into complimentary structural members in the vehicle body. In this way both the hinges and the latch would not be required to sustain the entire

loading arising from the lateral impact.

CLAIMS

1. A door for a vehicle comprising a first peripheral region on which are disposed a spaced pair of hinge mountings for pivotably connecting the door to a vehicle body; a second peripheral region, opposite the first region, on which is disposed a mounting for a latch for the door; a first girder member extending between one of the hinge mountings and the latch mounting and rigidly attached to both mountings; and a second girder member extending between the other of the pair of hinge mountings and the latch mounting and rigidly attached to both mountings.
2. A door as claimed in Claim 1 wherein the girder members have mounted on them at least part of a door mechanism such as a latch, window guide or window winder.
3. A door for a vehicle as claimed in Claim 1 or
5. A door for a vehicle comprising a first peripheral region on which are disposed a spaced pair of hinge mountings for pivotably connecting the door to a vehicle body; a second peripheral region, opposite the first region, on which is disposed a mounting for a latch for the door; a first girder member extending between one of the hinge mountings and the latch mounting and rigidly attached to both mountings; and a second girder member extending between the other of the pair of hinge mountings and the latch mounting and rigidly attached to both mountings.
10. A door as claimed in Claim 1 wherein the girder members have mounted on them at least part of a door mechanism such as a latch, window guide or window winder.
15. A door as claimed in Claim 1 wherein the girder members have mounted on them at least part of a door mechanism such as a latch, window guide or window winder.
20. A door for a vehicle as claimed in Claim 1 or Claim 2 including external cladding in the form of an outer skin panel and an inner cladding in the form of a trim panel.
25. A door as claimed in Claim 3 characterised in that both the skin panel and the cladding panel are unstressed.
30. A door for a vehicle as hereinbefore described with reference to, and as illustrated in the accompanying drawing.
35. A vehicle having at least one door according to any preceding claim which door is coupled to the body by way of a hinge linking each hinge mounting on the door to a hinge mounting on the vehicle body; and there is provided a latch linking the latch mounting on the door to a latch mounting on the vehicle body, the hinge and latch mountings of the vehicle body being coupled to structural members of the vehicle body adapted to resist compressive loads arising from front and/or rear impacts on the vehicle.
40. A vehicle as claimed in Claim 5 wherein the door girder members, at least with the door closed, co-operate with structural members in the body to resist lateral impacts on the door.